Online Supplementary Material

- **Table S1:** Chemical composition of carbonates

- **Table S2:** Ca isotope results for standard SRM915a in Multidynamic mode

Table S1. Chemical composition of carbonates

Sample	2548	2560	2523	2525	1855	1556	2301	P2104.94
SiO_2 (wt%)	17.8	5.2	3.02	45.3	27	16	14.8	0.221
Al_2O_3	2.04	0.448	0.715	0.889	5.99	3.67	2.74	<0.04
Fe_2O_3	11.5	22.3	0.65	11.1	2.17	3.42	1.3	0.0398
MgO	10.7	5.45	0.551	2.1	1.42	16.3	1.23	0.231
CaO	22.1	31.8	51.1	18.5	32.8	22.4	42.6	55.5
Na_2O	<0.05	<0.05	<0.05	<0.05	1.14	<0.05	<0.05	<0.05
K_2O	0.741	0.137	0.407	<0.06	1.25	1.84	0.803	<0.06
TiO_2	1.49	0.0094	0.0194	0.0136	0.211	0.132	0.0641	<0,002
P_2O_5	0.122	0.0121	0.0134	0.126	0.0508	0.07	0.0243	0.0218
MnO	0.708	1.08	1.12	0.952	0.0504	0.0738	0.0243	<0,004
LOI	31.9	31.7	41.4	20.1	26.2	35.4	35.5	43.3
Fe/Ca	0.37	0.49	0.01	0.42	0.05	0.11	0.02	0.00
Mg/Ca	0.67	0.24	0.02	0.16	0.06	1.01	0.04	0.01
K/Ca	0.04	0.01	0.01	0.00	0.05	0.10	0.02	<0.01
Ba (ppm)	17.3	3.37	17.7	32.6	378	805	57.8	69.4
Be	<0.6	<0.6	<0,6	<0,6	1.28	0.815	0.642	<0,6
Co	105	<6	<6	<6	<6	8.28	<6	<6
Cr	923	196	46.1	155	116	34.3	15.2	12.8
Cu	307	25.9	8.16	119	22.2	<6	6.45	6.8
Mo	<6	<6	<6	<6	<6	<6	<6	<6
Nb	19.5	<6	<6	<6	6.77	9.69	<6	<6
Ni	329	59.7	25.1	72.3	48.6	15.2	12.5	<10
Sc	16.5	<1	<1	<1	5.55	5	3.07	<1
Sr	79	54.5	58.6	133	228	61	671	1100
V	123	17.7	6.94	<2	34.4	39.2	16	<2
Y	11.4	12.6	3.7	3.04	12.2	9.31	10.8	<2
Zn	106	15.3	<10	<10	20.7	27	16.1	<10
Zr	93.6	<2	6.94	5.02	91.2	17.2	23.3	<2

Table S2. Ca isotope results for standard 915a measured in Multidynamic mode

	N. cycles	$^{40}K/^{40}Ca^{+}$ (10^{-7})	$^{40}Ca/^{44}Ca$ [1]	$\varepsilon^{40}Ca$ [1]	± (ε-units) [4]	F (‰/amu) [1]	$^{40}Ca/^{44}Ca$ [2]	$\varepsilon^{40}Ca$ [2]	± (ε-units) [4]
Ca_SRM_032207	270	2.4	47.16262	0.1	0.15	*0.5*	47.16259	0.08	0.13
Ca_SRM_032207b	270	0.3	47.16237	0.0	0.14	*0.5*	47.16237	0.03	0.14
Ca_SRM_033007b	270	14	47.15996	-0.5	0.13	*-3.0*	47.16202	-0.04	0.25
Ca_SRM_040307b	270	8.9	47.16215	0.0	0.18	*-3.7*	47.16301	0.17	0.24
Ca_SRM_061907	270	0.7	47.16202	0.0	0.25	*1.0*	47.16202	-0.04	0.25
Ca_SRM_062007	270	22	47.16218	0.0	0.18	*-1.1*	47.16218	-0.01	0.18
Ca_SRM_062407	270	0.4	47.15566	-1.3	0.33	*4.3*		*ID* [3]	
Ca_SRM_070807	270	1.1	47.16242	0.1	0.17	*-0.5*	47.16228	0.01	0.18
Ca_SRM_070907	250	1.9	47.16365	0.3	0.25	*-4.0*		*ID*	
Ca_SRM_072407	180	1.8	47.16375	0.1	0.21	*-1.8*		*ID*	
Ca_SRM_072407b	200	7.0	47.16031	-0.7	0.18	*-1.7*		*ID*	
Ca_SRM_072607	200	3.9	47.15023	-2.8	0.39	*4.3*		*ID*	
Ca_SRM_072707	200	2.5	47.16202	-0.3	0.20	*-0.1*	47.16202	-0.04	0.20
Ca_SRM_072807	200	2.0	47.16472	0.3	0.22	*-0.3*	47.16472	0.53	0.22
Ca_SRM_080107	200	24	47.15731	-1.3	0.33	*2.7*		*ID*	
Ca_SRM_081207a	200	11	47.15941	-0.5	0.30	*3.6*		*ID*	
Ca_SRM_081207b	200	9.1	47.16183	0.0	0.22	*-0.1*	47.16183	-0.08	0.22
Ca_SRM_081207c	200	1.1	47.15113	-2.3	0.25	*9.0*		*ID*	
Ca_SRM_081207d	200	1.1	47.16228	0.1	0.20	*0.4*	47.16228	0.01	0.20
Ca_SRM_081207e	200	1.2	47.16187	0.0	0.21	*0.2*	47.16187	-0.07	0.21
Ca_SRM_090707	110	3.6	47.16169	-0.1	0.34	*-0.3*	47.16169	-0.11	0.34
Ca_SRM_090707b	220	1.3	47.16161	-0.1	0.16	*-2.0*	47.16161	-0.13	0.16
Ca_SRM_090807	160	0.8	47.16303	0.2	0.22	*-1.7*	47.16303	0.17	0.22
Ca_SRM_091207	240	0.5	47.15540	-1.4	0.25	*-1.8*		*ID*	
Ca_SRM_092907b	270	0.6	47.16200	0.0	0.17	*-2.1*		*ID*	
Ca_SRM_100707	400	0.6	47.16276	0.2	0.17	*-1.4*	47.16276	0.11	0.17
Ca_SRM_102407	240	12	47.16082	-0.2	0.23	*-2.0*	47.16082	-0.30	0.23
Ca_SRM_102707	200	0.9	47.16251	0.1	0.18	*-1.7*	47.16251	0.06	0.18
Ca_SRM_110107	180	4.7	47.16202	0.0	0.21	*-1.9*	47.16202	-0.04	0.21
Ca_SRM_110507	260	3.1	47.16210	0.0	0.43	*-1.5*	47.16210	-0.03	0.43
Average			**47.16060**				**47.16222**		
Reproducibility (ε-units)			**1.5**				**0.34**		

[1]Unfiltered data

[2]Filtered data (Mass fractionation factor between ±2 ‰/amu).

[3]ID: insufficient data in range: runs for which the number of cycles between ±2 ‰/a.m.u was insufficient to obtain internal precision better than 0.5 ε-unit .

[4]Internal precision, defined as $2\sigma/\sqrt{n}$, where n is the total number of cycles